REMARKS

Claims 17, 18, 28, 29 and 32-35 are pending in this application following this amendment. Applicant believes that the Examiner will find the claims to be in condition for allowance upon consideration and examination.

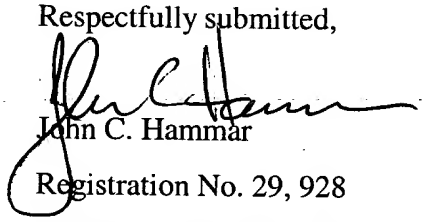
Applicant respectfully traverses the rejection of claims 17, 18, and 28 for obviousness-type double patenting over U.S. 5,746,553 (*Engwall*) in view of *Carver* (U.S. 4,937,768). The PTO has transformed double patenting which rectified undue patent term extension into a §103(a) based upon prior art that does not qualify as art under §103(a). U.S. Patent 5,746,553 and the present application share the same effective date.

How can both double patenting and obviousness be proper rejections based upon exactly the same references?

Engwall fails to describe or suggest a tool having a composite material as the mold surface. As suggested in the present specification, the present invention eliminates the need for very costly tooling by using a master mold to make composite molding surfaces rather than Invar face sheets. Please reconsider the double patenting and §103 obviousness rejections.

Please review and approve the revised drawings.

Respectfully submitted,



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Encl.: Revised Drawings

Substitute Page 10

Marked Up Version of Changes to the Specification

Change the paragraph beginning at Page 1, line 21:

The standard process for making composite parts included laying up a tool-side skin, usually several plies of resin-impregnated fiberglass or graphite cloth, on the surface of a tool known as a "bond assembly jig" or BAJ. If the part was to have a honeycomb core [.], the honeycomb material was cut and fitted onto the tool-side and the assembly is covered with a vacuum bag from which the air was withdrawn with a vacuum source. The bagged assembly was inserted into an autoclave and reconnected to the vacuum source while it was heated to cure the resin in the tool-side skin plies and bond the honeycomb to the skin. The bagged assembly was then removed from the autoclave and unbagged.

Change the paragraph beginning at Page 3, line 17 to Page 4, line 5:

This invention eliminated the use of two separate very costly tools, and it eliminated much of the hand manipulation of the part previously required during removal from and positioning onto the two tools. The particular difficulty of registering large flexible composite parts onto the tool on which it was being repositioned was eliminated because the part stayed on the same tool throughout its fabrication. Likewise, a partially fabricated part having only one skin was not pulled out of shape by the stresses in the skin induced during cure, because the part remains bonded to the tool face in its original laid-up position. Subsequent machining or drilling operations on the part are performed precisely at the designated position since the part is positioned on the tool exactly where it belongs. The usual quality control procedures such as statistical process control and the like are thus now possible in configuration quality control for parts made by this process. Thus, in an environment wherein dimensional control and certainty of manufacturing parts within statistically determined tolerances is critical to the ability to manufacture products at rates that are important to the commercial success of the business. [t]The "Dual Purpose Lay-Up Tool" invention disclosed [in the above mentioned]U.S. Patent [Application] 5,746,553 has made a significant contribution to industrial efficiency and quality of manufacture of large composite parts.

Marked Up Version of Changes to the Claims

17. (Amended) A method of manufacturing a composite part on a hybrid tool, comprising:

coating a face sheet of a hybrid tool with a release agent, said face sheet made from a [master tool]composite material made on a master tool, the composite material having a mold surface the same shape and size as a surface of said part;

laying up plies of resin impregnated fabric material on said face sheet to a desired thickness;

debulking said plies in a vacuum bag with gas pressure, and curing said resin to form said part on said face sheet;

placing said hybrid tool on a machine tool bed at a position designated in a machine tool program using positioning devices;

probing reference features on said hybrid tool to accurately establish the position of said face sheet relative to a home position of the machine tool, said reference features having been transferred from corresponding reference features on said master tool;

normalizing said machine tool part program to correspond to the actual position of the hybrid tool on the machine tool bed as determined by said probing of said hybrid tool reference features;

operating the machine tool to rotate a cutting tool while following a cutting path along and within a groove in said face sheet so that said cutting tool projects into said groove and engages the full thickness of said laid-up part on said hybrid tool face sheet for peripheral edge trimming of the part[.]; and

removing the trimmed part from the mold surface.

28. (Amended) A method of making a composite part on a hybrid tool:

coating a face sheet of a hybrid tool with a release agent, the face sheet made from a composite material made on a master tool, the composite material having a mold surface the same shape and size as a surface of the part;

laying up plies of resin impregnated fabric material on the face sheet to the desired thickness;

debulking the plies in a vacuum bag with gas pressure, and curing the resin to form the part on the face sheet;

placing the hybrid tool on a machine tool bed at a position designated in a machine tool program using spud and sine key;

probing reference features on the hybrid tool to accurately establish the position of the face sheet relative to a home position of the machine tool the reference features having been transferred from corresponding reference features on the master tool;

normalizing the machine tool part program to correspond to the actual position of the hybrid tool on the machine tool bed;

operating the machine tool to rotate a cutting tool while following a cutting path along and within a groove previously cut into said face sheet so that said cutting tool projects into said groove and engages the full thickness of the laid-up part in the tool face sheet.

cutting tool in the machine tool to the correct position for accurate machining of the part. The location devices include set points (also known as "spuds"), sine keys, and tool balls, the use of which are described in detail below. Use of these devices makes it possible to position the hybrid tool 30 on the bed 42 of the machine tool with extreme accuracy and to check that position and adjust the machine program to conform to the actual position of the face sheet 34 of the tool 30, thereby facilitating accuracy in the subsequent machining operations, since the position of the tool 30 and the part laid-up thereon are known accurately.

The attachment devices by which the tool 30 is secured to the machine tool bed 42 may be any conventional devices known in the art for fastening a workpiece to the bed of a machine tool. In this embodiment, the attachment devices are conventional toe clamps, the design of which is known to those skilled in the art. Normally, attachment devices additional to the locating spud and sine key pins will not be needed since the weight of the tool and the location devices are sufficient to hold it in place on the machine tool bed.

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The face sheet 32 has an upper upwardly facing surface 60 on which the constituent elements of the part are laid-up. The upper surface 60 is configured, by a process described in detail below, to a desired shape of one surface of the part to be made on the tool. Upwardly opening recesses are machined into the upper surface 60 of the face sheet 32 at positions corresponding to locations on the part that machining operations will be required later in the manufacturing process. The recesses include a peripheral groove 62, located on the face sheet 32 where the peripheral edge of the part will be cut, and cylindrical wells 63 (shown in Fig. 3) located on the face sheet 32 where holes will be drilled through the part. Other continuous grooves are located within the region bounded by the groove 62 where openings are to be cut out of the part. Some of the various shapes of recesses are illustrated in Figs. 5 and 6. The recesses receive a sacrificial material 64, described below, on which the constituent materials of the parts can be laid up on the face sheet 32 flush with the upper surface 60.

Approved by Examiner
10/16/02 - SS

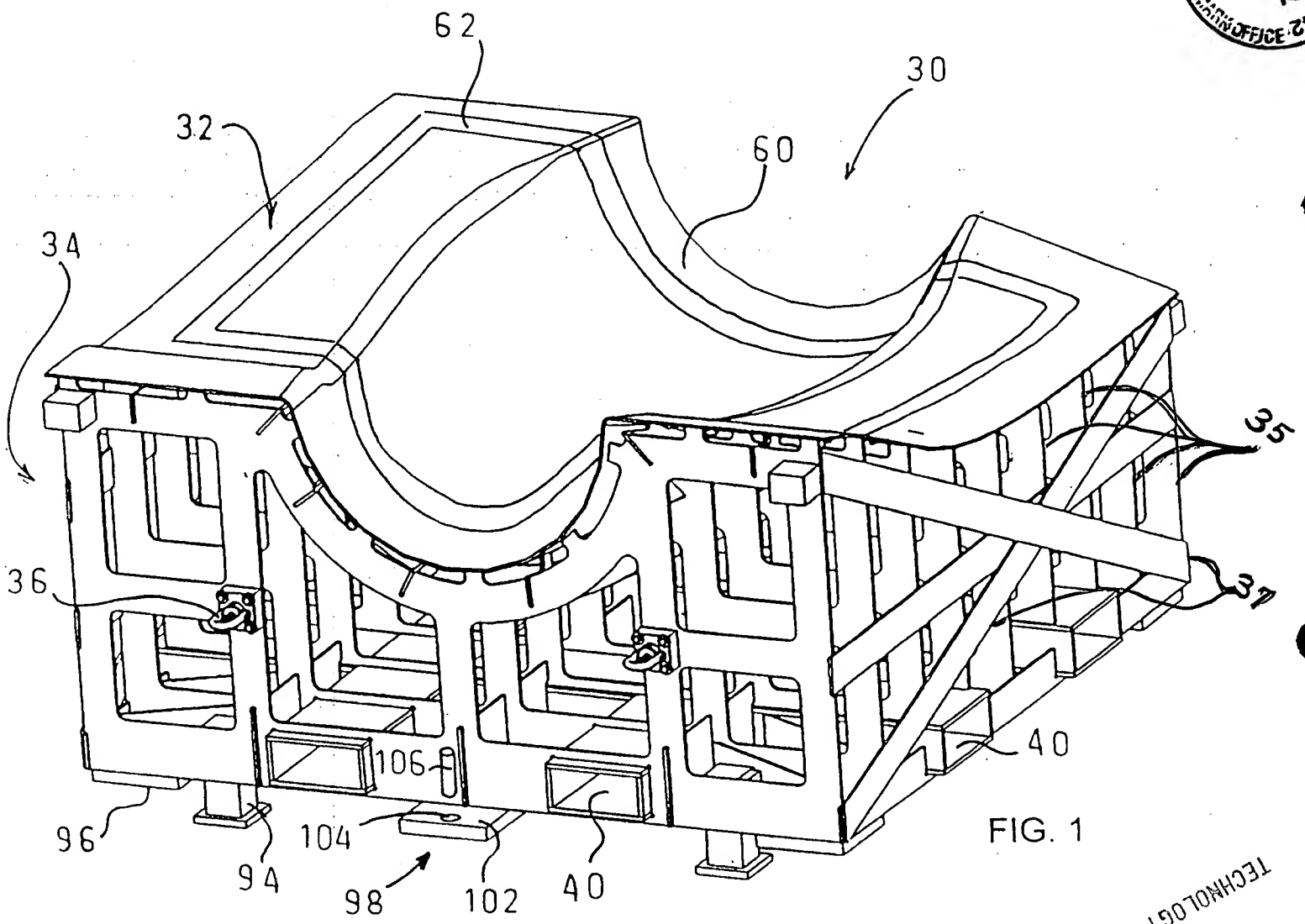

FIG. 1